



ALLOWED CLAIMS

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15. [Amended] A method of producing hydrogen comprising: reacting water and a water-soluble oxygenated hydrocarbon having at least two carbon atoms, in the presence of a metal-containing catalyst, wherein the catalyst comprises a metal selected from the group consisting of Group VIII transitional metals, alloys thereof, and mixtures thereof, and wherein the catalyst is adhered to a support comprising a carbon nanotube or a carbon fullerene.

16. [Amended] A method of producing hydrogen comprising: reacting water and a water-soluble oxygenated hydrocarbon having at least two carbon atoms, in the presence of a metal-containing catalyst, wherein the catalyst comprises a metal selected from the group consisting of Group VIII transitional metals, alloys thereof, and mixtures thereof, and wherein the catalyst is adhered to a support comprising a nanoporous support.

17. [Amended] A method of producing hydrogen comprising: reacting water and a water-soluble oxygenated hydrocarbon having at least two carbon atoms, in the presence of a metal-containing catalyst, wherein the catalyst comprises a metal selected from the group consisting of Group VIII transitional metals, alloys thereof, and mixtures thereof, and wherein the water and the oxygenated hydrocarbon are reacted at a temperature not greater than about 400°C, at a pressure where the water and the oxygenated hydrocarbon remain condensed liquids, and further comprising reacting the water and the water-soluble hydrocarbon in the presence of a water-soluble salt of an alkali or alkali earth metal.

21. [Amended] A method of producing hydrogen comprising: reacting water and a water-soluble oxygenated hydrocarbon having at least two carbon atoms, in the presence of a metal-containing catalyst, wherein the catalyst comprises a metal selected from the group consisting of Group VIII transitional metals, alloys thereof, and mixtures thereof, and wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of ethanediol, ethanedione, glycerol, glyceraldehyde, aldotetroses, aldopentoses, aldohexoses, ketotetroses, ketopentoses, ketohexoses and alditols.

22. [Amended] The method of Claim 21 wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of aldohexoses and corresponding alditols.

23. [Amended] The method of Claim 21 wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of glucose and sorbitol.

24. [Amended] The method of Claim 21 wherein the water-soluble oxygenated hydrocarbon is sucrose.

25. [Original] A method of producing hydrogen comprising: reacting water and a water-soluble

oxygenated hydrocarbon having at least two carbon atoms, at a temperature not greater than about 400°C, at a pressure where the water and the oxygenated hydrocarbon remain condensed liquids, and in the presence of a metal-containing catalyst, wherein the catalyst comprises a metal selected from the group consisting of Group VIII transitional metals, alloys thereof, and mixtures thereof.

26. [Original] The method of Claim 25, wherein the catalyst comprises a metal selected from the group consisting of nickel, palladium, platinum, ruthenium, rhodium, iridium, alloys thereof, and mixtures thereof.

27. [Original] The method of Claim 25, wherein the catalyst is further alloyed or mixed with a metal selected from the group consisting of Group IB metals, Group IIB metals, and Group VIIb metals.

28. [Original] The method of Claim 25, wherein the catalyst is further alloyed or mixed with a metal selected from the group consisting of copper, zinc, and rhenium.

29. [Original] The method of Claim 25, wherein the catalyst is adhered to a support.

30. [Original] The method of Claim 29, wherein the support is selected from the group consisting of silica, alumina, zirconia, titania, ceria, carbon, silica-alumina, silica nitride, and boron nitride.

31. [Original] The method of Claim 29, wherein the support is surface-modified to remove surface moieties selected from the group consisting of hydrogen and hydroxyl.

32. [Original] The method of Claim 31, wherein the support is modified by treating it with a modifier selected from the group consisting of silanes, alkali compounds, and alkali earth compounds.

33. [Original] The method of Claim 29, wherein the support is silica modified with trimethylethoxysilane.

34. [Original] The method of Claim 29, wherein the support is a zeolite.

35. [Original] The method of Claim 29, wherein the support is a carbon nanotube or a carbon fullerene.

36. [Original] The method of Claim 29, wherein the support is a nanoporous support.

37. [Original] The method of Claim 25, further comprising reacting the water and the water-soluble oxygenated hydrocarbon in the presence of a water-soluble salt of an alkali or alkali earth metal.

38. [Original] The method of Claim 37, wherein the water-soluble salt is selected from the group consisting of an alkali or an alkali earth metal hydroxide, carbonate, nitrate, or chloride salt.

39. [Original] The method of Claim 25, wherein the water-soluble oxygenated hydrocarbon has a carbon-to-oxygen ratio of 1:1.

40. [Original] The method of Claim 25, wherein the water-soluble oxygenated hydrocarbon has from 2 to 12 carbon atoms.

41. [Original] The method of Claim 25, wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of ethanediol, ethanedione, glycerol, glyceraldehyde, aldotetroses, aldopentoses, aldohexoses, ketotetroses, ketopentoses, ketohexoses, and alditols.

42. [Original] The method of Claim 25, wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of aldohexoses and corresponding alditols.

43. [Original] The method of Claim 25, wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of glucose and sorbitol.

44. [Original] The method of Claim 25, wherein the water-soluble oxygenated hydrocarbon is sucrose.

50. [Amended] A method of producing hydrogen comprising: reacting water and a water-soluble oxygenated hydrocarbon having at least two carbon atoms, at a temperature of from about 100°C to about 450°C, and at a pressure where the water and the oxygenated hydrocarbon are gaseous, in the presence of a metal-containing catalyst, wherein the catalyst comprises a metal selected from the group consisting of Group VIII transitional metals, alloys thereof, and mixtures thereof, the catalyst being adhered to a support, and wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of ethanediol, ethanedione, glycerol, glyceraldehyde, aldotetroses, aldopentoses, ketotetroses, ketopentoses, ketohexoses, and alditols.

51. [Original] A method of producing hydrogen comprising: reacting water and a water-soluble oxygenated hydrocarbon having at least two carbon atoms, at a temperature of not greater than about 400°C, and at a pressure where the water and the oxygenated hydrocarbon remain condensed liquids, in the presence of a metal-containing catalyst, wherein the catalyst comprises a metal selected from the group consisting of Group VIII transitional metals, alloys thereof, and mixtures thereof, the catalyst being adhered to a support.

52. [Original] The method of Claim 51, wherein the support is selected from the group consisting of silica, alumina, zirconia, titania, ceria, carbon, silica-alumina, silica nitride, and boron nitride, modified to render to remove surface moieties selected from the group consisting of hydrogen and hydroxyl.

53. [Original] The method of Claim 52, wherein the support is modified by treating it with a modifier selected from the group consisting of silanes, alkali compounds, and alkali earth compounds.

54. [Original] The method of Claim 51, wherein the support is silica modified with trimethylethoxysilane.

55. [Original] The method of Claim 51, wherein the water-soluble oxygenated hydrocarbon has a carbon-to-oxygen ratio of 1:1.

56. [Original] The method of Claim 51, wherein the water-soluble oxygenated hydrocarbon is selected from the group consisting of ethanediol, ethanedione, glycerol, glyceraldehyde, aldotetroses, aldopentoses, aldohexoses, ketotetroses, ketopentoses, ketohexoses, and alditols.

57. [New] The method of Claim 4, wherein the water and the oxygenated hydrocarbon are reacted at a temperature of from about 100°C to about 300°C.

58. [New] The method of Claim 4, wherein the water and the oxygenated hydrocarbon are reacted at a pH of from about 4.0 to about 10.0.

59. [New] The method of Claim 4, wherein the catalyst comprises a metal selected from the group consisting of nickel, palladium, platinum, ruthenium, rhodium, iridium, alloys thereof, and mixtures thereof.

60. [New] The method of Claim 4, wherein the catalyst is further alloyed or mixed with a metal selected from the group consisting of Group IB metals, Group IIB metals, and Group VIIb metals.

61. [New] The method of Claim 4, wherein the catalyst is further alloyed or mixed with a metal selected from the group consisting of copper, zinc, and rhenium.

62. [New] The method of Claim 4, wherein the catalyst is adhered to a support.

63. [New] The method of Claim 62, wherein the support is selected from the group consisting of silica, alumina, zirconia, titania, ceria, carbon, silica-alumina, silica nitride, and boron nitride.

64. [New] The method of Claim 62, wherein the support is surface-modified to remove surface moieties selected from the group consisting of hydrogen and hydroxyl.

65. [New] The method of Claim 62, wherein the support is modified by treating it with a modifier selected from the group consisting of silanes, alkali compounds, and alkali earth compounds.

66. [New] The method of Claim 62, wherein the support is silica modified with trimethylethoxysilane.

67. [New] The method of Claim 62, wherein the support is a zeolite.

68. [New] The method of Claim 62, wherein the support is a carbon nanotube or a carbon fullerene.

69. [New] The method of Claim 62, wherein the support is a nanoporous support.